REMARKS

Claims 2-28 were pending in the application. Claims 2-28 stand rejected. Claims 18 and 20-24 were cancelled. Claims 3-5, 10-11, 17, 19, and 28 were amended. Claims 29-33 were added.

Claims 2-12, 26, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Takiguchi et al. (US Patent 6,549,681 B1). The rejection stated:

> 'Regarding claim 5, Takiguchi et al. discloses a method for producing a cropped digital image, comprising the steps of:
>
> 'a) providing a plurality of partially overlapping source digital images (fig. 64a, numerals 61 and 62);
>
> 'b) providing a cropping aspect ratio L:H (fig. 67, labels p1-p4), the cropping aspect ratio being the ratio of the length (p1 and p2) to the height (p1 and p4) of the cropped digital image;
>
> 'c) providing a cropping criterion (fig. 67, label: CONDITION), the cropping criterion being a criterion for the size and location (Fig. 67, label: CONDITION has a plurality of associated formulas that inherently describe size and location.) of the cropped digital image;
>
> 'd) combining the source digital images to form a composite digital image (Fig. 62);
>
> 'e) automatically (or "automatically" in col. 15, line 42 with respect to a "user" in col. 15, line 40) computing a main subject (or "charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE) of the composite digital image (that includes "overlaps" in col. 12, line 45) using a reasoning engine (fig. 5, num. 517);
>
> 'f) automatically selecting (or "automatically extract-ing" in col. 5, lines 57,58) the cropping region ("rectangular area" in col. 5, line 59) of the composite digital image according the cropping criterion, said cropping region being a rectangular region having aspect ratio L:H (Fig. 67, labels: the length of p1 and p2: and the length of p1 and p4), and having size and location determined by the cropping criterion; and
>
> 'g) cropping the composite digital image to the cropping region to form a cropped digital image (Fig. 64D);

'h) wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area (Fig. 64A-64C clearly shows the claimed "largest in area" in the shaded regions) of the set of all composite digital image regions having said aspect ratio L:H (determined according to the formulas of fig. 67) that are centered at the centroid (Figures 64A-64C clearly shows the shaded regions that are centered between two images) of the main subject (or "charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE regardless if the main subject was detected from the claimed reasoning engine) of the composite digital image.'

The Response to Arguments portion of the Office Action stated:

'However, the examiner has a new interpretation of a portion of claim 5, lines 17-20:

'wherein the cropping criterion (fig. 66,num. 81) specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image regions (as shown in the shaded region of fig. 67, num. 72) having paid aspect ratio L:H (or segments from point p1 to point p4 and point p4 to point p3) that are centered at the centroid (the shaded region is in the center of fig. 67,num. 71) of the main subject of the composite digital image.

'Applicant's arguments on page 34, last paragraph, filed 3/17/2006 have been fully considered but they are not persuasive and states:

> '"In any case, the discussed extraction methods do not disclose or suggest automatically computing a main subject of the composite digital image using a reasoning engine, as required by Claim 5."

'The examiner respectfully disagrees. Since Takiguchi et al. does disclose automatically (or "automatically" in col. 15, line 42 with respect to a "user" in col. 15, line 40) computing a main subject (or "charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE) of the composite digital image (that includes "overlaps" in col. 12, line 45) using a reasoning engine (fig. 5, num. 517).

'Note that in claim 5 the claimed reasoning engine does not have any influence on any of the limitations. The examiner suggests using the results of the reasoning engine, but there appears to be no limitation that uses the results of the reasoning engine.'

Claim 5 has been amended to state:

5. A method for producing a cropped digital image, comprising the steps of:

providing a plurality of partially overlapping source digital images;

providing a cropping aspect ratio L:H, the cropping aspect ratio being the ratio of the length to the height of the cropped digital image;

providing a cropping criterion, the cropping criterion being a criterion for the size and location of the cropped digital image;

combining the source digital images to form a composite digital image;

computing a main subject of the composite digital image;

automatically selecting the cropping region of the composite digital image according to the cropping criterion, said cropping region being a rectangular region having said aspect ratio L:H, and having size and location determined by the cropping criterion; and,

cropping the composite digital image to the cropping region to form a cropped digital image;

wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image.

The amendment of Claim 5 is broadening and is supported by the original language of Claim 5. The rejection itself indicates that no new issue has been presented by this change. The deleted language was moved to added Claim 33.

Claim 5 requires selecting a cropping region according to a cropping criterion, which specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image

regions having the aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image. The rejection equates the term "centroid" with "center":

> "centered at the centroid (the shaded region is in the center of fig. 67,num. 71)"

and

> "centered at the centroid (Figures 64A-64C clearly shows the shaded regions that are centered between two images)".

The rejection is contrary to the ordinary meaning of "centroid". A dictionary defines centroid as:

> "1: CENTER OF MASS 2: a point whose coordinates are the averages of the corresponding coordinates of a given set and which for a given planar or three-dimensional figure (as a triangle or sphere) corresponds to the center of mass of a thin plate of uniform thickness and consistency or a body of uniform consistency having the same boundary". (*Webster's Ninth New Collegiate Dictionary*, Merriam-Webster, Springfield, Massachuetts, (1990), page 221)

A mathematical dictionary has a similar definition:

> "CENTROID The centroid is the center of mass of an object. It is the point where the object would balance if supported by a single support. For a triangle, the centroid is the point where the three medians intersect. For a one-dimensional object of length L, the centroid can be found by using the integral
>
> $$\frac{\int_0^L x\rho dx}{\int_0^L \rho dx}$$
>
> where $\rho(x)$ represents the mass per unit length of the object at a particular location x. The centroid for two- and three-dimensional objects can be found with double or triple integrals." (*Dictionary of Mathematics Terms*, 2nd ed., D. Downing, ed., Barron's, Hauppauge, New York, (1995), pages 37-38)

There is no teaching or suggestion in Takaguchi et al. relating to a centroid of the composite image. The office action equated the term "centroid" with "center", as

if there were no difference between the two. Appendix A attached to this amendment, shows three sketches. (The sketches are intended to be illustrative of the argument that center and centroid are different, as evidenced by the above definitions. An attempt was made to keep the sketches accurate, but the sketches are not themselves presented as evidence of patentability. It is noted that drafting software is readily available, such as AutoCAD™, which will conveniently and separately calculate the center and centroid (sometimes called "center of gravity") of a two-dimensional closed shape.)

The upper sketch taken from Figure 67 in Takiguchi et al. The solid line corresponds to panoramic image 71 in Figure 67 of Takiguchi et al. The finely-dashed line corresponds to extracted area 72 (shown cross-hatched in Figure 67). Two circles with cross-hairs are also shown. The lower circle and cross-hairs is the center of the panoramic image 71 and center of the extracted area 72. The upper circle and cross-hairs is the centroid of the panoramic image 71. (The sketches are intended as argument.

Claim 5 requires the cropping region to be rectangular having the aspect ratio L:H and being largest in area of the set of all composite digital image regions centered at the centroid of the main subject of the composite digital image. (For simplicity, discussion here assumes that the centroid of the main subject is the same as the centroid of the composite digital image. That is not necesarily the case. For example, the main subject may be off to one side rather than being centered. See the discussion below of the definition of "main subject" used in the application.) A cropping region defined by Claim 5, with the same aspect ratio as extracted area 72, (hereafter "Claim 5-example cropping region") is shown with a coarsely-dashed line in the bottom sketch of Appendix A. The middle sketch combines the upper and lower sketches.

The Claim 5-example cropping region is tilted relative to the extracted area 72. This tilt follows from the language of Claim 5, in which the cropping region is largest in area of the set of all composite digital image regions, having the same aspect ratio L:H, centered at the centroid of the panoramic image 71. This is unlike the teachings of Takiguchi et al., in which the angular relationship between the extracted area 72 and one or both of the input images is set before sizing the extracted area. Takiguchi et al. states

"According to extraction method 1 shown in Fig. 64A, a horizontal image is employed as a reference and a rectangular image 63 is extracted. According to extraction method 2 in Fig. 64B, the other image that is inclined for synthesization is employed as a reference, and a rectangular image 64 is extracted. According to extraction method 3 in Fig. 64C, a rectangular image is extracted that is inclined at half of an inclination angle for the two images. In this example, a rectangular image 65 that is inclined at θ/2 is extracted. The extracted images 64 and 65 are obtained according to the extraction methods 2 and 3 are rotated by minus θ and minus θ/2 to serve as image data having no inclination. According to extraction method 4 in Fig. 64D, a rectangular image that includes both two images is extracted, and corresponds to a rectangular image 66 in this example.

"Although various patterns can be used for overlapping two images, and various methods can be used for extracting a rectangular area from the panoramic images, the system determines in advance which of the methods for extracting a rectangular area is to be employed for each image overlapping pattern." (Takiguchi et al., col. 41, line 56 to col. 42, line 9; also see angles θ and θ/2 marked in Figures 64A and 64C; emphasis added)

This quote from Takiguchi et al. is contrary to the requirement in Claim 5 that the cropping criterion specifies that the cropped region "is largest in area of the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image". Extraction methods 1-2 and 3 of Takiguchi et al. crop based on an extracted area 72 that is a rectangle having a side at a specific angle to an edge of the panoramic image 71 (an edge of one of the two input images). In methods 1-2 the side is parallel to the edge of the panoramic image. In method 3, the side is disposed at a specific angle to that edge (half of the inclination angle for the two input images). The cropping criterion used in Takaguchi et al. is predetermined as to the tilt of the extracted area 72 relative to the panoramic image 71. (See Takaguchi et al., Figure 65, in which the criterion is extraction method 1; col. 42, lines 9-13) This is incompatible with Claim 5, since the criterion that the cropped region would be "the largest in area of the set of all ..." would be superceded.

Claim 5 requires computing a main subject of the composite digital image. The centroid is of this main subject. The rejection states:

> 'e) automatically (or "automatically" in col. 15, line 42 with respect to a "user" in col. 15, line 40) computing a main subject (or "charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE) of the composite digital image (that includes "overlaps" in col. 12, line 45) using a reasoning engine (fig. 5, num. 517)'.

The sections of Takiguchi et al. relied upon here teach computing features of the input images not the composite. Takiguchi et al. states:

> "When the panoramic image synthesization unit 517 functions as the determination means, it determines whether or not the images to be synthesized consist mainly of characters. For this determination, a histogram of the luminance of an image is acquired. That is, the distribution of the luminance shown in FIGS. 7 and 8 is employed for the determination. When the luminance is distributed across the entire surface as shown in FIG. 8, an image is determined as a natural image. As the acquisition of the histogram of a luminance need be performed only in a range where an image overlaps, and does not have to be performed for the entire image, the speed for processing can be increased." (Takiguchi et al., col. 12, lines 36-47; emphasis added)

As the emphasized language in the above quote indicates, Takiguchi et al. determines whether or not the images to be synthesized consist mainly of characters. This quote does not address the composite image.

The rejection relies upon the above quoted portion of Takiguchi et al. to disclose computing a main subject of the composite digital image. Takiguichi et al. describes aquiring a histogram of the luminance of an image to be synthesized and determining whether the image consists mainly of characters based upon the distribution of the luminance as shown in Figures 7 and 8. The histogram plots luminance versus frequency for the entire image. There is no information as to location. How could one apply the above definitions of "centroid" to one of the peaks in Figure 7?

A main subject of a digital image has a location in the digital image. This is indicated in the application as filed (for example, note the difference between original Claims 4 and 5) and is stated unequivocally in U.S.

Patent No. 6,282,317, which was incorporated by reference in the application, and language from which was added to the application by earlier amendment, states in a sentence of that added language:

> "It is an object of this invention to provide a method for detecting the location of main subjects within a digitally captured image and thereby overcoming one or more problems set forth above."

The specification of the application must be considered in determining the meaning of "main subject" in Claim 5. The specification of an application must be considered in determining the meaning of claim terms, even if there is no express definition.

> '[I]n particular requiring that any definition of claim language in the specification be express, is inconsistent with our rulings that the specification is "the single best guide to the meaning of a disputed term," and that the specification "acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication."' *Phillips v. AWH Corp.*, 415 F.3d 1303; 2005 U.S. App. LEXIS 13954; 75 USPQ.2d 1321, (Fed. Cir., 2005), quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

Thus, the criterion proposed by the rejection--a luminance peak lacking location information--would not be a main subject in accordance with Claim 5.

Added Claim 33 has language from Claim 5 and is allowable as depending from Claim 5 and as follows. Claim 33 states:

> 33. The method of claim 5 wherein said computing is automatic using a reasoning engine.

The office action stated in relation to this language:

> 'Applicant's arguments on page 34, last paragraph, filed 3/17/2006 have been fully considered but they are not persuasive and states:
>
> > '"In any case, the discussed extraction methods do not disclose or suggest automatically computing a main subject of the composite digital image using a reasoning engine, as required by Claim 5."
>
> 'The examiner respectfully disagrees. Since Takiguchi et al. does disclose automatically (or "automatically" in col. 15, line 42 with

respect to a "user" in col. 15, line 40) computing a main subject (or "charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE) of the composite digital image (that includes "overlaps" in col. 12, line 45) using a reasoning engine (fig. 5, num. 517).

'Note that in claim 5 the claimed reasoning engine does not have any influence on any of the limitations. The examiner suggests using the results of the reasoning engine, but there appears to be no limitation that uses the results of the reasoning engine.'

The position taken by the office action is based upon the interpretation of "main subject" as being '"charac-ters" in col. 12, lines 38,39 or a natural image as shown in fig. 8, label: NATURAL IMAGE'. As above discussed, this interpretation is contrary the usage of "main subject" in the application, since there is no location information in the frequency vs. intensity histogram. The position taken by the office action is also based upon equating "centroid" with "center". As discussed above, the term "centroid" is in Claim 5 and is not taught by Takaguchi et al. Claim 35, in depending from Claim 5, requires automatically selecting the cropping region of the composite digital image according to a cropping criterion, and cropping the composite digital image to the cropping region. The cropping criterion specifies that the cropping region is centered at the centroid of the computed main subject of the composite digital image. Claim 35 adds that the computing is automatic using a reasoning engine. Thus, the results of the reasoning engine are used in the cropping criterion used for cropping the composite digital image.

Claims 9-12 are allowable as depending from Claim 5 and as follows.

Amended Claim 10 states:

10. The method claimed in claim 9, wherein the step of providing source digital images further comprises applying a metric transform to a source digital image such that the pixel values of the source digital image changed by said transform are linearly or logarithmically related to scene intensity.

The amended language was suggested in the previous office action, which stated:

'While the examiner agrees with the applicant that Takiguchi et al. does not teach an exposure transform that change pixel

intensities as mentioned on page 32, last paragraph, changing pixel intensities using an exposure transform is not claimed and instead the following is claimed in claim 3:

'"applying a metric exposure transform to a source digital image such that the pixel values of the source digital image are linearly or logarithmically related to scene intensity."' (page 2)

The rejection stated in relation to Claims 11-12:

'Regarding claim 11, Takiguchi et al. discloses the method of claim 9, wherein the step of providing source digital images further comprises:

'a) applying linear exposure transform(s) (or "coor-dinate transformation" in col. 40, lines 16,17.) to one or more of the source digital images to produce source digital images having pixel values that closely match (The above mentioned coordinate transformation is used for "matching" in col. 40, line 4 as shown in fig. 62.) in an overlapping region.

'Claim 12 is rejected the same as claim 11. Thus, argument similar to that presented above for claim 11 is equally applicable to claim 12 except for the limitation of exposure falloff or "shift" in col. 1, line 65 or "shifting" in col. 39, line 66 in terms of a "lens" in col. 1, line 64 during recording.'

Claims 11-12 state:

11. The method claimed in claim 9, wherein the step of providing source digital images further comprises applying linear exposure transform(s) to one or more of the source digital images, wherein said transform(s) ~~to~~ produce source digital images having pixel values that closely match in an overlapping region.

12. The method claimed in claim 9, wherein the step of providing source digital images further comprises applying radial exposure transform(s) to one or more of the source digital images to compensate for exposure falloff.

The changed language of Claim 11 is supported by the application as filed, notably the original claims. The argument presented in the previous Amendment

as to Claims 11-12 and not rebutted in the office action still applies and is restated in the following.

In the rejection of Claims 11-12, all of the referenced portions of Takiguchi et al. relate to the application of geometric transforms that change pixel locations, rather than exposure transforms that can change pixel intensities. (In Claim 11, the transform produces digital images having pixel values that closely match in an overlapping region. In Claim 12, the transform compensates for exposure falloff.) Takaguichi et al. states:

> "Further, when an image is recorded with an electronic camera, the portion of the image that is located at the periphery of a lens is more or less distorted. This also causes a shift of less than one pixel." (Takaguichi et al., col. 1, lines 63-65; emphasis added)

A "shift" described in units of pixels is geometric. Takaguchi et al. further states:

> "The shifting of two images when they are synthesized can be represented by a difference between translation distances and rotations in the x and y directions, and a difference in magnification rates (since, for synthesization of more than two images, two-image synthesization is repeated, two images are employed for this explanation). The matching points (x,y) and (x',y') are represented as follows. [equation omitted] where θ denotes a rotation angle, Δx and Δy denote translations, and m denotes a magnification rate. This coordinate transformation can be represented by acquiring parameters A, B, C, and D." (Takaguchi et al., col. 39, line 66 to col. 40, line 18; see also Figure 62)

The geometric positions (coordinates) of the pixels in Takaguichi et al. are transformed. This contrasts with Claims 11-12, which require that the transform produce digital images having pixel values that closely match in an overlapping region (Claim 11) and the transform compensate for exposure falloff.

The rejection stated as to Claims 3:

> 'Claims 3 including limitation "a)", 4 and 28 are rejected the same as claim 5. Thus, argument similar to that presented above for claim 5 is equally applicable to claims 3, "a)", 4 and 28 except for the additional limitation as disclosed in Takiguchi et al. of:
>
> 'i) and wherein the source digital images have pixel values (or luminance values along the luminance axis of figure 23) that are

linearly related to scene intensity (since the luminance values along the luminance axis are in a linear arrangement along the luminance axis and where each luminance value on the luminance axis corresponds to the claimed scene intensity or the luminance of either PAPER or a CHARACTER as shown in fig. 23) and

'j) the step of providing source digital images further comprises:

'j1) applying a metric exposure transform (or a histogram as shown in fig. 23) to a source digital image such that the pixel values of the source digital image are linearly related to scene intensity (as described in paragraph "i)" above.'

Claim 3 has been amended to state:

3. A method for producing a cropped digital image, comprising the steps of:

providing a plurality of partially overlapping source digital images;

providing a cropping aspect ratio L:H, the cropping aspect ratio being the ratio of the length to the height of the cropped digital image;

providing a cropping criterion, the cropping criterion being a criterion for the size and location of the cropped digital image;

combining the source digital images to form a composite digital image;

automatically selecting the cropping region of the composite digital image according to the cropping criterion, said cropping region being a rectangular region having said aspect ratio L:H, and having size and location determined by the cropping criterion; and,

cropping the composite digital image to the cropping region to form a cropped digital image;

wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of one of the sets:

a) the set of all composite digital image regions having said aspect ratio L:H;

b) the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the composite digital image; and

c) the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image.

To aid in further prosecution and avoid the need for usages such as "Claim 3 a)", Claim 3 has been rewritten to remove the final clause and dependent Claims 29-31 have been added, which state:

29. The method of claim 3 wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image regions having said aspect ratio L:H.

30. The method of claim 3 wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the composite digital image.

31. The method of claim 3 wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image.

32. The method of claim 3 wherein the source digital images have pixel values that are linearly or logarithmically related to scene intensity and the step of providing source digital images further comprises applying a metric exposure transform to a source digital image, wherein said exposure transform changes the pixel values of the source digital image such that, following said applying, the pixel values of the source digital image are linearly or logarithmically related to scene intensity.

Claims 29-31 correspond to 3 a), 3 b), and 3 c), respectively. Claim 32 has the language currently deleted from Claim 3. No new issues are presented, since the

subject matter of all of these claims has already been considered in relation to Claim 3.

Claim 3 requires a cropping criterion having one of the limitations of Claims 29-31. Claim 29 is limited to Claim 3 a), the composite digital image region is largest in area of the set of all composite digital image regions having said aspect ratio L:H. As discussed above in relation to Claim 5, Takaguchi et al. "determines in advance which of the methods for extracting a rectangular area is to be employed for each image overlapping pattern." (Takiguchi et al., col. 42, lines 7-9) The cropping criterion used in Takaguchi et al. is predetermined as to the tilt of the extracted area 72 relative to the panoramic image 71. (See Takaguchi et al., Figure 65, in which the criterion is extraction method 1; col. 42, lines 9-13) This is incompatible with Claim 5, since the criterion that the cropped region would be "the largest in area of the set of all composite digital image regions having said aspect ratio L:H" would be superceded.

Claims 30 and 31 are allowable on the grounds discussed above in relation to Claim 5, except the discussion of main subject is limited to Claim 31. Both Claims 30 and 31 require the largest cropping region to be centered at a centroid.

Added Claim 32 states:

> 32. The method of claim 3 wherein the source digital images have pixel values that are linearly or logarithmically related to scene intensity and the step of providing source digital images further comprises applying a metric exposure transform to a source digital image, wherein said exposure transform changes the pixel values of the source digital image such that, following said applying, the pixel values of the source digital image are linearly or logarithmically related to scene intensity.

The language of Claim 32 from Claim 3, except Claim 32 requires that the "exposure transform changes the pixel values". This amendment was suggested in the office action, which stated:

> 'While the examiner agrees with the applicant that Takiguchi et al. does not teach an exposure transform that change pixel intensities as mentioned on page 32, last paragraph, changing pixel

intensities using an exposure transform is not claimed and instead the following is claimed in claim 3:

"'applying a metric exposure transform to a source digital image such that the pixel values of the source digital image are linearly or logarithmically related to scene intensity.'" (page 2)

Claims 2 and 6-8 are allowable as depending from Claim 3.

Claim 26 is allowable on the grounds discussed above in relation to Claims 5 and 33.

Claims 4 and 28 are allowable on the grounds discussed above in relation to Claims 3, 29, and 32.

Claims 3, 13-14, 16, and 27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1). Claim 3 is allowable on the grounds discussed above.

Claims 13-14, 16, and 27 are allowable as depending from Claim 3.

Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1).and further in view of Seitz et al. (View Mophing, Proceedings of the 23rd annual conference on Computer graphics and interactive techniques, ACM Press, 1996, pp. 21-30). Claims 17-18 and 22-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1) further in view of Yoshida et al. (US Patent 6,266,128 B1). Claims 19-21 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1) further in view of Suzuki et al. (US Patent 6,094,218 A).

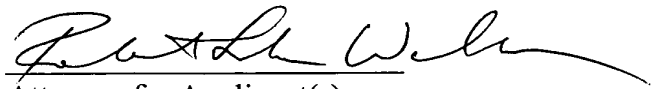
Claims 18 and 20-24 were cancelled to maintain a constant number of claims. Claim 17 was amended to include language from Claim 18. Claim 19 was amended to include language from Claims 20-24.

Claims 15, 17, 19, and 25 are allowable as depending from Claim 3.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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